

# ***Environmental Reconnaissance in OEF: Special Operations Weather's Leading Role***

by  
Lt Col Joe Benson, USAF

*From his seated position behind the M-2 heavy machine gun in his vehicle's turret, TSgt Ray Decker could see everything. His lofted perch offered him vistas of the sharp profile of distant mountains to the north, a meandering river flowing from northeast to southwest, an unimpeded view of the horizon and the jagged rocky outcrops which flanked the dusty trail. Riding above his four teammates, TSgt Decker, a special operations weatherman, was in the ideal position to conduct environmental reconnaissance, exactly his purpose on this combat patrol. Moving out from his firebase in the Uruzgan Province on that day in August 2008, Ray could not have imagined the impact of his collection.<sup>i</sup>*

## **Introduction**

Since 9/11, environmental reconnaissance (ER) has become special operations weather's (SOWT) leading role. SOWT personnel conducting ER were among the first U.S. military into Afghanistan in October 2001. Since that time, SOWT personnel have operated in every corner of the country, in both non-permissive and politically sensitive areas. The data they collect, whether near-target, in advance of assaulting forces or on a routine patrol, have proven pivotal in securing mission success. Today, time and effort placed on the ER mission far exceed that which is spent on the more traditional weather functions, such as forecasting and mission briefings. ER training consumes the lion's share of time during the SOWT pre-deployment and certification training phase, a phase that lasts over six months of the 10<sup>th</sup> Combat Weather Squadron's (CWS) 15-month Phased Operational, Refit/Retool and Training cycle. So what exactly is ER?

## **Environmental Reconnaissance**

Joint Publication (JP) 3-05, *Doctrine for Joint Special Operations*, defines ER as "operations conducted to collect and report **critical** hydrographic, geological, and meteorological **information**."<sup>ii</sup> For the record, there is no "weather reconnaissance", and while weather collection plays a major role in ER missions, it is but one component. SOWT personnel conduct ER in order to collect on all aspects of the environment: the terrain, rivers, surf-zone and littoral regions and, of course, the weather. More specifically, SOWT assess the terrain for trafficability as well as for potential landing zones, determine the likelihood and impacts of an avalanche, assess river systems for fording operations and flood forecasting,

<b>Report Documentation Page</b>			<i>Form Approved OMB No. 0704-0188</i>		
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE <b>2011</b>	2. REPORT TYPE	3. DATES COVERED <b>00-00-2011 to 00-00-2011</b>			
4. TITLE AND SUBTITLE <b>Environmental Reconnaissance in OEF: Special Operations Weather's Leading Role</b>		5a. CONTRACT NUMBER			
		5b. GRANT NUMBER			
		5c. PROGRAM ELEMENT NUMBER			
6. AUTHOR(S)		5d. PROJECT NUMBER			
		5e. TASK NUMBER			
		5f. WORK UNIT NUMBER			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>10th Combat Weather Squadron (10 CWS),Hurlburt Field,FL,32544</b>		8. PERFORMING ORGANIZATION REPORT NUMBER			
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)			
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)			
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>Same as Report (SAR)</b>	18. NUMBER OF PAGES <b>9</b>	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			

collect surf zone and tidal data to determine optimal beach landing sites, and collect weather observations in order to establish localized weather trends and in support of ongoing or near-term operations.

## **Formal Tasking**

ER rightly falls into the domain of SOWT. SOWT's ownership of the mission is backed not only by Air Force and joint doctrine as well as Air Force (AF) Tactics Techniques and Procedures (TTP) but also official US Central Command (CENTCOM) and Special Operations Command-Central (SOCCENT) taskings.

In the winter of 2007, SOCSENT levied two standing taskings on its deployed SOWT personnel. The first tasking was avalanche assessment and it had two purposes; one was humanitarian-related while the other dealt with operational mobility and reach. The second tasking launched SOWT's involvement in the riverine environment. Over the last three years, river assessment has quickly become SOWT's foremost mission in Operation Enduring Freedom (OEF) in Afghanistan.

Joint Publication (JP) 3-59, *Meteorological and Oceanographic Operations*, AF Doctrine Document (DD) 2-07, *Special Operations*, and AFDD 2-9.1, *Weather Operations* provide additional direction. AFDD 2-7 underscores SOWT's ownership of the ER mission: "SOWT members are able to *independently operate* [author's emphasis] in permissive and semi-permissive environments or as an attachment to special operation forces (SOF) teams in hostile areas. SOWT are the *only force* [author's emphasis] in the DOD organized, trained, and equipped to perform special reconnaissance operations in support of environmental requirements for the JFC (Joint Forces Commander)." <sup>iii</sup>

Since 2007, Combined Joint Special Operations Task Force-Afghanistan (CJSOTF-A) has executed six concepts of operations (CONOP) directly related to the ER mission. SOWT liaison officers (LNOs), serving on the J-3 staff (Operations), used the aforementioned doctrine and TTP in crafting these CONOPs. For these multi-week CONOPs, the most recent of which is ongoing, SOWT personnel were the supported force. The results of these missions have earned high praises. LTC Chris Riga, 1<sup>st</sup> Battalion, 3<sup>rd</sup> Special Force Group's commander, while serving as the CJSOTF-A J-3 in spring 2008 commented, "I wish I had a SOWT for all my fielded teams." <sup>iv</sup> He's not alone. As a career field, SOWT has been consistently among the top three most deployed career fields since 2006. A surging personnel tempo (PERSTEMPO) is proof: OEF commanders can't get enough.

What is it about ER that has drawn such praises in OEF? Let's break down this multi-faceted mission examining its components and detail its many positive contributions. We begin with weather.

## **Weather Assessment**

First and foremost, SOWT personnel must be talented weathermen. Much like their conventional counterparts, SOWTs learn weather forecasting during tech school at Keesler AFB, MS. As with any technical skill, weather forecasting is a highly perishable one. It must be sustained through repetitive training and pre-deployment exercises. As mentioned above, SOWT personnel spend six months conducting pre-deployment and certification training. A portion of that time is dedicated to *recertifying* critical weather forecasting skills. Aiding the 10<sup>th</sup> CWS in this task is the 23<sup>rd</sup> Weather Squadron (WS).

The 23<sup>rd</sup> WS, one of the Air Force Special Operations Command's (AFSOC) newest squadrons, has helped facilitate SOWT forecaster training by opening their weather operations center to visiting SOWTs. As AFSOC's weather "hub", the 23<sup>rd</sup> WS is a unique position to help sharpen a SOWT's technical training. Since its inception in July 2009, the 23<sup>rd</sup> WS has assumed close to fifty percent of all weather forecasting in support of SOF in OEF.<sup>v</sup> By providing the bulk of weather forecasting support, particularly of the longer term variety, SOWTs can focus their attention on the short-term forecasts, otherwise known as the "Nowcast."

According to AF TTP 3-3, Nowcasts are the by-product of "... atmospheric conditions [and] the local effects of the terrain."<sup>vi</sup> SSgt Travis Sanford was the SOWT attached to a CJCSOTF-A SOF team which became pinned down during a major troops-in-contact (TIC) event in northwestern Afghanistan. After hours of fighting, Travis's team had taken casualties, casualties needing immediate exfil (exfiltration or evacuation). But the weather was questionable. Using five hours of collected weather observations, Travis issued a six-hour valid Nowcast back to higher headquarters. Based on his forecast, medical evacuation (MEDEVAC) helicopter crews concluded the cloud ceilings in the passes would stay above required minimums permitting the recovery to proceed to extract wounded Americans.

There are numerous similar examples. After nearly nine years in OEF, Nowcasts have proven invaluable in supporting operations. Yet while a SOWT's forecasting acumen must be sharp, his ability to observe and promptly transmit weather observations is the gold standard.

A weather observation taken at or near a target is often the deciding "GO/NO GO" factor prior to mission execution. The value of ground-truth weather conditions is only amplified in places like Afghanistan, where the deadly amalgam of weather and terrain have combined to take too many American lives.

In 2009 alone, SOWT personnel took and disseminated over 20,000 weather observations from their remote outposts while executing reconnaissance or other SOF missions. Each observation served to paint a clearer picture of Afghanistan's dynamic environment, a picture which, without the presence of a SOWT, would not be possible. In the extreme, its value can be measured in lives saved. Such was the case in February 2009 at a firebase in Uruzgan Province.

Staff Sergeant Tom Howser's timely and accurate reporting arguably saved a critically wounded teammate's life following a firefight with insurgent forces. MEDEVAC was called in to retrieve the wounded soldier, but was initially unable to fly through the pass leading to the team's firebase. That's when Sergeant Howser took charge. A skilled weather observer, Sergeant Howser noticed the subtle changes in air pressure and winds, changes which indicated drying conditions and a lifting of the low blanket of clouds shrouding the pass. His recommendation to the MEDEVAC team: launch the helicopters, you'll get through. Sure enough, they launched and got through.<sup>vii</sup> The soldier was air evacuated to a nearby treatment facility and survived. In this case, minutes mattered. Undoubtedly, weather observing made a difference. Two hundred miles to the west of Sergeant Howser's firebase, weather observing was equally as indispensable when Staff Sergeant Alex Eudy and his SOF team hit a catastrophic improvised explosive device (IED) during a high risk mission in the Farah Province.

Despite being thrown 100 feet from the wreckage of his vehicle, Sergeant Eudy had the presence of mind to pass weather reports to responding MEDEVAC assets dispatched to recover four wounded operators. Not only had Sergeant Eudy been thrown from his vehicle, he also suffered serious injuries to both legs, injuries which prevented him from standing. Sergeant Eudy dealt with the pain, maintained security of the crash site and vectored helicopters to his location. Thanks to Sergeant Eudy, the MEDEVAC assets were provided critical situational awareness on the weather prior to arrival. What's more, Sergeant Eudy's presence of mind helped mitigate MEDEVAC's speedy response that, in turn, helped minimize the extent of his and his teammates' injuries.

On weather observing alone, ER's prominent role in OEF is critical. But as indicated earlier, weather is but one component of this multi-faceted mission.

## **Avalanche Assessment**

SOCENT's formal tasking to conduct avalanche assessment has had a profound impact on SOWTs in the 10<sup>th</sup> CWS, namely in the area of training and equipping. Almost immediately, AFSOC secured the funds to purchase avalanche reconnaissance kits. SOWTs were equipped within weeks enabling personnel to attend accredited mountaineering schools such as the

American Alpine Institute in Washington State where SOWT students earned a level 2 avalanche certification.

The purpose of avalanche assessment is to “ensure safety of special operations team movement, enable humanitarian efforts and evaluate conditions for future operations (e.g. alternate landing zone (LZ) and resupply)”.<sup>viii</sup> Thus, conducting avalanche assessment means getting up to altitude, often well over 12,000 feet. SOWT professionals examine a mountain side’s snow field to determine the potential of an avalanche. Selecting high altitude, alternate LZs provide options for rotary wing assets when crossing vast mountain ranges and rugged terrain; the Hindu Kush falls into this category.

On the humanitarian side, avalanche assessments can forewarn mountainside villages of impending disasters that subsequently enable life-saving evacuation operations. These actions also serve to strengthen positive perceptions of Coalition forces among the indigenous population. In Afghanistan’s Hindu Kush, some villages are routinely decimated by avalanches and certain mountain passes, such as the Salang Pass, face the fury of avalanches nearly every year.

## **Terrain Assessment**

ER’s third responsibility is terrain assessment. Assessing the terrain has numerous implications, not the least of which is vehicle trafficability. As JP 3-05 states, along with hydrographic and meteorological information, ER missions attempt to collect and report on “geological” information.<sup>ix</sup>

SOWT personnel determine the trafficability of unimproved surfaces (e.g. trails) or open terrain. In much of Afghanistan, terrain assessments factor heavily into mission planning for mounted operations. Trail conditions in the summer may be remarkably different than those in the winter, when snow and mud can hinder a team’s movement. Thus, SOWT-collected and disseminated terrain assessments must be made throughout the year to account for seasonal variations. Relative to the enemy, SOWT personnel on the ground identify “rat-lines,” paying particular attention to those in contested territory. This information may serve intelligence analysts in drawing more far-reaching assumptions on enemy lines of communication, cache sites and cross-border infiltration routes.

Capt Colin Caldwell, while attached to a SOF team in late 2008, conducted numerous ER missions in disputed areas of western Afghanistan in support of future ground reconnaissance operations. His terrain assessments showed striking differences between summer and fall. Vehicles were slowed by moist ground conditions when the rains began in winter. By late winter, the wadis had begun to fill.<sup>x</sup> This further aggravated vehicle traffic. Still, the question

remains: is terrain assessment worth the risk? Why not use high-resolution satellite imagery instead?

Colin's missions prove the value of terrain assessments in support of planning and conducting combat patrols and other operations in enemy-infested territory. Even the highest resolution imagery, terrain maps and mapping tools such as Falcon View cannot discern the subtle variations in road and trail conditions. When selecting LZs, whether for fixed-wing or rotary wing operations, knowing the soil particle size can be critical. Helicopter LZs comprised of fine, silty soil run the risk of "brown out" conditions on landing. Thus, trying to exfil a team under fire from such an LZ adds additional risks to the force, risks that might be avoided with SOWT personnel as part of an advance force reconnaissance team. Yet of ER mission's five mission components, none have attained as far-reaching impacts as the river assessment mission.

## **River Assessment**

Less than a week after SOCCENT's official tasking in early 2007, SOWT professionals deployed in to the Uruzgan Province began conducting river assessments. Since that time, SOWT forces have completed 135 vital river assessments. Determining a river's current speed in order to assess river traversing options may be an easy one to grasp. Conducting a river assessment, however, involves a significant amount of additional data collection.

As with a weather observation, a full river assessment includes several elements that, when taken together, present a profile of a river system at a given position. The speed of a river is not uniform. A river's depth at various points, the clarity of water, the river bottom composition, the bank slope and profile, natural or man-made obstacles, the high water mark and the water temperature—all of which are elements of a total assessment—vary over space and time. Not only must data be collected at points across the width of a river, but also up and down the banks as well. As a result, usable assessments must include several observation points gathering the aforementioned elements as well as others.

Much of the data can be collected from bridges, using small boats and rafts or from fixed positions on the shore. Something as simple as images from a digital camera offer useful data. Often times, a thorough assessment requires getting into the river and getting wet, as Staff Sergeant Joey Cedillo did in June 2010 when assessing the upper Helmand River.

Without a bridge or boat, Sergeant Cedillo was forced to set up a zip-line across a seventy-foot expanse of river. Using a simple carabineer, he snapped into a harness and slowly worked his way across the swiftly moving, chilly water taking speed, depth and clarity measurements every six feet.<sup>xi</sup>

As the example shows, collecting data from a river can be a risky endeavor. What's more, river assessment missions may expose the SOWT Airman and his supporting element to harassing enemy fire and maneuver. Given the risk, why do it?

Joint Publication 3-06 sums it up this way: "Riverine operations exploit the advantages of the waterways for movement, capitalizing on mobility to find, fix, and destroy hostile forces".<sup>xii</sup> Gathering the data, therefore, becomes necessary for successfully negotiating this environment, whether for transport, assaulting the enemy, escape and evasion or simply crossing. According to JP 3-06, successful riverine operations "... require current, useable [environmental] intelligence in a timely manner in order to plan and direct operations, achieve mission success, and protect [the] force".<sup>xiii</sup> JP 3-06 lists the collection of "... hydrographic information, including waterway depth, length, width, bottom composition, tidal ranges and currents, and bank characteristics (e.g. length, bedrock/soil composition and trafficability)" as important elements of river assessment.<sup>xiv</sup>

When time was of the essence and decisions on route selection proved life-saving, SOWT personnel expedited their data collection and advised their ground force commanders. In March 2009, Master Sergeant Gary Pelletier, a SOWT Airman attached to a team in the Uruzgan Province, made one such river assessment while under enemy fire. Sergeant Pelletier assessed the perfect crossing point, taking into account current speed, depth and bank slope. With the enemy bearing down, he quickly directed his SOF team and their Afghan partnered force across the river and out of enemy contact.<sup>xv</sup>

Civil Affairs, U.S. Army Corps of Engineers, US Agency for International Development and other government agency-sponsored agro-commerce, transportation and bridging projects have benefited from river assessment missions conducted across Afghanistan. As an example, SOWT-collected riverine data taken between February and June 2010 helped engineers settle on the most suitable location for a bridge in the southern Uruzgan Province. More recently, nine river assessments taken in southern Afghanistan helped to determine the final site selections for nearly \$22 million in bridging and transportation-related projects.

### **The Tactical ER Report (TERREP)**

The component missions of ER all seek to gain information from differing environmental realms, whether from the sea, land, river or atmosphere. Most ER missions result in the collection of data from more than just one of the environmental spheres thereby maximizing the data-collection mission. Even on a short-term daylight patrol, SOWT personnel actively collect and record environmental conditions. On certain missions, they query host nation civilians for additional, "Farmer's Almanac"-like environmental insights. A great deal of data is acquired during an ER. SOWT Airmen tie it all together into an extensive, yet coherent report

called the Tactical ER Report (TERREP). These reports have become so popular that AFSOC made it into an official Major Command (MAJCOM) form.

An unintended beneficiary of the TERREP has been AFSOC's intelligence directorate. Since reviewing their first TERREP in July 2008, intelligence specialists at AFSOC and at the 720<sup>th</sup> Special Tactics Group have converted SOWT TERREPs into nearly 100 Intel Information Reports, or IIRs. These IIRs have proven to be a treasure trove of environmental intelligence. National level intelligence agency specialists have crowed about the value of these IIRs and have written over 45 glowing evaluations.<sup>xvi</sup> In fact, SOWT IIRs are responsible for satisfying countless, long-standing requests for information on environment and terrain in the CENTCOM area of responsibility (AOR). What's more, evidence shows AFSOC is equally as impressed. SOWT reporting accounts for a large chunk of AFSOC's human-derived information. No small achievement for a squadron of only 65, which includes LNOs collocated with each US Army Special Operations Command (USASOC) unit.

SOWT LNOs work with each of the Special Forces Groups, the 160<sup>th</sup> Special Operations Aviation Regiment and the 75<sup>th</sup> Ranger Regiment. The primary purpose of the SOWT LNO is to support his partnered USASOC unit. His support responsibilities extend from the O-6 level down to the ODA or platoon. He must provide his supported unit access to the two principal TERREP repositories: the 23<sup>rd</sup> WS and CJSOTF-A's TIGR databases, and tailor the information according to their unique requirements.

## **The Road Ahead**

For the foreseeable future, ER will remain SOWT's leading role in OEF. Regardless of shifting operational focuses and strategic priorities, ER will play an active role and will continue to support SOF and partnered-Afghan operations. In fact, there's good reason to believe that the application of ER will expand. SOWT personnel will increasingly augment their ground collection with a growing array of unattended sensors, whether dropped in Afghanistan's rivers or emplaced across the country's often inhospitable terrain. In greater numbers, SOWT personnel will operate small unmanned aerial systems (SUAS) extending the reach of their reconnaissance capabilities. SOWT will more frequently interact with host-nation personnel learning more about Afghanistan's nuanced weather patterns and the general environment.

In the future SOWT Airmen will increasingly supply Civil Affairs, the Army Corps of Engineers and other governmental agencies, such as USAID, with coveted environmental data, the likes of which affect decisions concerning the expenditure of millions of dollars. SOWT will continue to play an important role in this counterinsurgency operation while continuing to hone the tactical skills training with its sister Special Tactics units and partnered Special Forces.

At Hurlburt Field, FL., SOWT Airmen will continue to strengthen their technical know-how cycling through the 23<sup>rd</sup> WS for forecasting refresher training.

As they've been for nearly ten years, SOWT Airmen will be ready for the fights ahead. To be sure, there will be risk. Executing ER will continue to put SOWT personnel into harm's way. Yet this will be nothing new for the men of the 10<sup>th</sup> CWS, nearly half of whom have earned AF Combat Action Medals. SOWT Airmen will continue to operate in non-permissive and politically sensitive environments because that is where their collected data is of greatest merit. The SOWT cadre understands the importance of SOF missions. SOF missions are no-fail, and no fail missions require nothing short of what their talents can provide: accurate, relevant and timely environmental intelligence.

*Two days into the mission, TSgt Ray Decker's team became pinned down by a withering enemy fire from two sides. Between bursts of fire from his M-2, Ray passed weather reports for circling close air support aircraft. The team had taken casualties and desperately needed inbound MEDEVAC helicopter. Exposing himself to even greater risk, Ray positioned himself in order to guarantee the transmission of his reports. His environmental reporting helped posture the helicopter and enabled the successful evacuation of one of his teammates. Ray's bravery would earn him his deployment's second Bronze Star and an Army Commendation Medal with valor.*

---

*Lt Col Joe Benson is the Commander of the 10th Combat Weather Squadron (10 CWS) at Hurlburt Field, FL. He is a master parachutist (static line), military free fall parachutist, demolitions supervisor, has attended numerous survival schools and is air assault qualified. In 2006, he earned the Navy Postgraduate School's annual Pat Tillman Award given to the school's top special operations student.*

<sup>i</sup> Raymond Decker, TSgt, Interview with the author, 11 Jan 2009.

<sup>ii</sup> Joint Pub 3-05, *Doctrine for Joint Special Operations* (Washington D.C., 1998), II-5.

<sup>iii</sup> Air Force Doctrine Document 2-7, *Special Operations* (Washington D.C., 2010), 32-33.

<sup>iv</sup> Christopher Riga, LTC, "Re: SOWT in OEF" Email to author, 30 August 2009.

<sup>v</sup> Bryan Adams, Lt Col, Interview with the author, 13 Aug 2010.

<sup>vi</sup> Air Force Tactics Techniques and Procedures 3-3, *Guardian Angel and Special Tactics* (Nellis AFB, NV: 2009), 13-3.

<sup>vii</sup> Bryce "Tom" Howser, SSgt, Interview with the author, 1 Mar 2009.

<sup>viii</sup> Air Force Tactics Techniques and Procedures 3-3, *Guardian Angel and Special Tactics* (Nellis AFB, NV: 2009), 13-29.

<sup>ix</sup> Joint Pub 3-05, II-5.

<sup>x</sup> James "Colin" Caldwell, Capt, Interview with the author, 24 Feb 2009.

<sup>xi</sup> Joey Cedillo, SrA, Interview with the author, 12 June 2010.

<sup>xii</sup> Joint Test Pub 3-06, *Doctrine for Joint Riverine Operations* (Washington D.C., 1991), I-1.

<sup>xiii</sup> Ibid., VI-2.

<sup>xiv</sup> Ibid., VI-2.

<sup>xv</sup> Gary Pelletier, MSgt, Interview with the author, 5 May 2009.

<sup>xvi</sup> Dan Hunsinger, GS-14, Interview with the author, 3 Feb 2010.